

Patent claims

1. Footwear with an upper (11) and a sole construction having an outsole (19), in which:
- 5 the upper (11) is constructed with an outer material (13) and with a waterproof functional layer (15) at least partially lining the outer material (13) on the inner side of the latter and having an upper end region (61) on the sole side with an outer-material end region (21) and a functional-layer end region (23);
- 10 the functional-layer end region (23) has a region requiring sealing; and
- the outsole (19) is adhesively bonded to the upper end region (61) by means of outsole cement located on it,
- 15 the outsole cement being formed at least in a subregion of the outsole lying opposite the region requiring sealing of the functional-layer end region (23) by a reactive hot-melt adhesive (33, 33a) which brings about waterproofness when in the fully reacted state.
- 20 2. Footwear according to Claim 1, in which the functional-layer end region (23) has an overhang (24) projecting beyond the outer-material end region, and the outsole cement is formed at least in a subregion of the outsole which is closed in the
- 25 direction of the sole periphery and lies opposite at least part of the width of the overhang by a reactive hot-melt adhesive (33; 33a) which brings about waterproofness when in the fully reacted state.
3. Footwear according to Claim 2, in which the
- 30 reactive hot-melt adhesive (33; 33a) extends over the entire width of the overhang.
4. Footwear according to Claim 2 or 3, in which the upper end region (61) extends essentially parallel to the tread of the outsole (19) and the functional-
- 35 layer end region (23) projects beyond the outer-material end region (21) in the direction of the centre of the outsole.
5. Footwear according to Claim 1 or 2, in which the upper end region (61) extends essentially

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perpendicular to the tread of the outsole (19) and the functional-layer end region (23) projects beyond the outer-material end region (21) in the direction of the tread.

5 6. Footwear according to one of Claims 1 to 5, with an insole (17), to which the functional-layer end region (23) is fastened.

7. Footwear according to Claim 6, in which the functional-layer end region (23) is joined to the  
10 insole (17) by means of a seam (39).

8. Footwear according to Claim 6, in which the functional-layer end region (23) is joined to the insole (17) by cement-lasting (25).

9. Footwear according to Claim 4, in which the  
15 functional-layer end region (23) is kept essentially parallel to the tread of the outsole (19) by means of string-lasting (45).

10. Footwear according to one of Claims 6 to 9, in which the outer-material end region (21) is secured to  
20 the functional-layer end region (23) by means of adhesive.

11. Footwear according to one of Claims 6 to 8, in which the overhang (24) is bridged by a gauze strip (43), one side of which is fastened to the outer-  
25 material end region (21) and the other side of which is fastened to the insole (17).

12. Footwear according to Claim 9, in which the overhang (24) is bridged by a gauze strip (43), one side of which is fastened to the outer-material end  
30 region (21) and the other side of which is fastened to the string-lasting (45).

13. Footwear according to Claim 9, in which the outer-material end region (21) is kept essentially parallel to the tread of the outsole (19) by means of a  
35 second string-lasting (47).

14. Footwear according to Claim 1, in which the upper end region (61) has an upper-end-region outer side remote from the functional layer (15)

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and the outsole cement is formed at least in a subregion of the upper-end-region outer side which is closed in the direction of the sole periphery by reactive hot-melt adhesive (33; 33a) and the outer material (13) consists at least in this subregion of a material which can be penetrated by the reactive hot-melt adhesive (33; 33a) that is liquid before fully reacting, so that in this subregion the reactive hot-melt adhesive (33; 33a) adhesively bonds the functional layer (15) with a sealing effect.

15. Footwear according to Claim 1, in which the upper end region (61) has an upper-end-region outer side remote from the functional layer (15), the upper end region (61) has an upper end edge (69), within which a free zone (70), free from upper material, is formed and the outsole cement is formed at least in a region of the free zone (70) which is closed in the direction of the sole periphery and is adjacent to the upper end edge by reactive hot-melt adhesive (33; 33a) which has penetrated between the insole underside (27) and the functional-layer end region (21) and forms there a cementing region closed in the direction of the sole periphery.

16. Footwear according to Claim 14 or 16, in which the outer material and the functional layer are each part of a multi-layer laminate (59).

17. Footwear according to one of Claims 14 to 16, in which the upper end region (61) extends essentially parallel to the tread of the outsole (19).

18. Footwear according to one of Claims 14 to 16, in which the upper end region (61) extends essentially perpendicular to the tread of the outsole (19).

19. Footwear according to one of Claims 14 to 18, with an insole (17), to which the upper end region (61) is fastened.

20. Footwear according to Claim 19, in which the upper end region (61) is joined to the insole (17) by means of a seam (39).

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21. Footwear according to Claim 19, in which the upper end region (61) is joined to the insole (17) by cement-lasting (25).

22. Footwear according to Claim 21, in which a region of the upper end region (61) adjacent to an upper end region edge (69) is excepted from the cement-lasting (25).

23. Footwear according to one of Claims 14 to 18, in which the upper end region (61) is kept essentially parallel to the tread of the outsole (19) by means of string-lasting (45).

24. Footwear according to one of Claims 1 to 4, 6 to 17 and 19 to 23, in which the outsole (19) is essentially flat.

25. Footwear according to one of Claims 1 to 23, in which the outsole (19) essentially has turned-up edges with a flat tread region and a border (35) rising up from the latter in an essentially perpendicular direction.

26. Footwear according to one of Claims 1 to 25, in which the outsole (19) is provided with reactive hot-melt adhesive (33; 33a) in that sub-region in which it lies opposite the region of the functional layer (15) to be sealed and is otherwise provided with conventional outsole cement (38).

27. Footwear according to one of Claims 1 to 25, in which the outsole (19) is provided with reactive hot-melt adhesive (33; 33a) essentially over its entire top side (31) facing the upper (11).

28. Footwear according to one of Claims 1 to 27, in which at least part of the reactive hot-melt adhesive (33) located on the outsole (19) is formed by an expanded reactive hot-melt adhesive (33a).

29. Footwear, in particular according to Claim 1, in which the sole construction comprises an insole (17) and a gauze strip (43) is arranged between the insole (17) and the upper end region (61), a first side edge of which gauze strip being joined to the insole (17) and a second side edge being joined both to the outer-

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material end region (21) and to the functional-layer end region (23).

30. Footwear according to Claim 29 in conjunction with Claim 1, in which the outsole cement is formed at least in a subregion of the outsole (19) which is closed in the direction of the sole periphery and lies opposite the gauze strip (43) by a reactive hot-melt adhesive (33; 33a).

31. Footwear according to Claim 30, in which the outsole cement is formed at least in a subregion of the outsole (19) which is closed in the direction of the sole periphery and lies opposite the gauze strip (43) by an expanded reactive hot-melt adhesive (33a).

32. Footwear according to Claim 30, in which the entire outsole surface is provided with reactive hot-melt adhesive (33; 33a).

33. Footwear according to Claim 30, in which the entire outsole surface is provided with expanded reactive hot-melt adhesive (33a).

34. Footwear according to one of Claims 29 to 33, in which a filler (77) is arranged between the insole underside (27) and the outsole top side (31).

35. Footwear according to one of Claims 29 to 34, in which the gauze strip (43) is sewn (73, 75) both to the insole (17) and to the outer-material end region (31) as well as to the functional-layer end region (23).

36. Footwear according to one of Claims 30 to 35, in which the outer-material end region (21) and the functional-layer end region (23) are fastened to each other by means of a fixing adhesive (79).

37. Footwear according to one of Claims 1 to 36, which has a part-insole over part of the shoe length in which the footwear is constructed according to one of Claims 6-8, 10, 11, 19-22 or 24-36, and is constructed in the remaining part of the shoe length according to one of Claims 9-13 or 23-28.

38. Footwear which in a front foot region has a sole construction according to one of Claims 1 to 36

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and in a rear foot region has a shoe construction according to another of Claims 1 to 36.

39. Process for the production of footwear, having the following production steps:

- 5 a) an upper (11) is created, constructed with an outer material (13) and with a waterproof functional layer (15) at least partially lining the outer material (13) on the inner side of the latter and provided with an upper end region (61) on the sole side;
- 10 b) the outer material (13) is provided with an outer-material end region (21) on the sole side and the functional layer (15) is provided with a functional-layer end region (23) on the sole side, a region requiring sealing being created at the functional-layer
- 15 end region (23);
- c) outsole cement is applied to an outsole (19) and the outsole is adhesively attached to the upper end region (61), a reactive hot-melt adhesive (33; 33a) which brings about waterproofness when in the fully reacted
- 20 state being applied as outsole cement at least in a subregion of the outsole which lies opposite the region of the functional-layer end region (23) requiring sealing after the adhesive attachment of the outsole.

40. Process according to Claim 39, in which
- 25 the functional-layer end region (23) is provided with an overhang (24) projecting beyond the upper-material end region (21)
- and reactive hot-melt adhesive (33; 33a) is applied as outsole cement at least in a subregion of the outsole
- 30 which is closed in the direction of the sole periphery and lies opposite at least part of the width of the overhang after the adhesive attachment of the outsole (19).

41. Process according to Claim 39, in which
- 35 reactive hot-melt adhesive (33; 33a) is applied as outsole cement at least in a subregion of the outsole which is closed in the direction of the sole periphery and lies opposite at least part of the upper-end-region outer side after the adhesive attachment of the outsole

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(19), the outer material (13) being produced at least in this subregion from a material which can be penetrated by the reactive hot-melt adhesive (33; 33a) that is liquid or liquefied before fully reacting, so that there the reactive hot-melt adhesive (33; 33a) brings about a sealing adhesive bonding of the functional layer (15).

42. Process according to Claim 39, in which the upper end region (61) is provided with an upper end edge (69), within which a free zone (70), free from upper material, is formed, and reactive hot-melt adhesive (33; 33a) is applied as outsole cement at least in a subregion of the outsole which is closed in the direction of the sole periphery and lies opposite at least one region of the free zone adjacent to the upper end edge (69) after the adhesive attachment of the outsole and is applied to the outsole (19) at such a rate and the outsole (19) is pressed against the upper-end-region outer side in such a way that reactive hot-melt adhesive (33; 33a) penetrates between the insole underside (37) and the functional-layer end region (23) and forms there an adhesive bonding region which is closed in the direction of the sole periphery.

43. Process according to Claim 39, in which the sole construction is provided with an insole (17), a gauze strip (43) is arranged between the insole (17) and the upper end region (61), a first side edge of which strip being joined to the insole (17) and a second side edge being joined both to the outer-material end region (21) and to the functional-layer end region (23), and reactive hot-melt adhesive (33; 33a) is applied as outsole cement at least in a subregion of the outsole which is closed in the direction of the sole periphery and lies opposite the gauze strip (43) after the adhesive attachment of the outsole (19).

44. Process according to one of Claims 39 to 43, in which reactive hot-melt adhesive (33; 33a) is applied to the outsole (19) in that region which lies opposite

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the region of the functional-layer end region (23) to be sealed after the outsole (19) has been pressed onto the upper-end-region outer side, and otherwise conventional outsole cement (38) is applied.

5 45. Process according to one of Claims 39 to 43, in which reactive hot-melt adhesive (33; 33a) is applied to the entire outsole.

46. Process according to Claim 39 or 45, in which an expanding reactive hot-melt adhesive (33a) is  
10 applied to the outsole (19) at least in that region which lies opposite the region of the functional-layer end region (23) to be sealed after the outsole (19) has been pressed onto the upper-end-region outer side.

47. Process according to one of Claims 39 to 46, in  
15 which a reactive hot-melt adhesive (33; 33a) which can be cured by means of moisture is used, which adhesive is applied to the region to be cemented and is exposed to moisture for reacting.

48. Process according to one of Claims 39 to 46, in  
20 which a reactive hot-melt adhesive (33; 33a) which can be thermally activated and can be cured by means of moisture is used, which adhesive is thermally activated, applied to the region to be cemented and is exposed to moisture for reacting.

25 49. Process according to one of Claims 39 to 48, in which a thermoplastic is added to the reactive hot-melt adhesive (33; 33a) before using the latter.

50. Process according to one of Claims 39 and 44 to  
30 49, in which the outer-material end region (21) is fixed to the functional-layer end region (23) before the outsole is cemented on.

51. Outsole (19) which can be cemented onto an  
upper of footwear, the top side of the said sole, to be adhesively attached to the upper (11), being provided  
35 at least partially with non-reacted reactive hot-melt adhesive (33; 33a) which brings about waterproofness when in the fully reacted state.

52. Sealed shoe with an upper and an insole (1) to which the upper is joined, polyurethane-based reactive

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hot-melt adhesive (3) being applied over the surface area onto the underside of the shoe in the region of the insole (1) and the part of the upper joined to the latter and pressed.

5 53. Shoe according to Claim 52, in which an open-pore, adhesive-compatible material (4) is applied over the entire shoe and the side region.

54. Shoe according to Claim 52, in which an open-pore, adhesive-compatible material (4) is applied over  
10 part of the shoe and the side region.

55. Shoe according to one of Claims 52 to 54, in which the surface of the open-pore, adhesive-compatible material (4) is cemented flush in the reactive hot-melt adhesive (3).

15 56. Shoe according to one of Claims 52 to 55, in which the underside of the shoe to be further processed has a flat and uniform surface.

57. Shoe according to one of Claims 52 to 56, in which the upper is joined to the insole (1) by means of  
20 cement-lasting.

58. Shoe according to Claim 57, in which the reactive hot-melt adhesive (3) is applied over a width of about 1 cm, overlapping between the insole (1) and the lasted upper.

25 59. Process for producing a shoe with an upper and insole (1), in which the upper is joined to the insole (1) and polyurethane-based reactive hot-melt adhesive (3) is applied over the surface area onto the underside of the shoe in the region of the insole (1) and the  
30 part of the shaft joined to the latter and is pressed.

60. Process according to Claim 59, in which an open-pore, adhesive-compatible material (4) is applied over the entire shoe and the side region.

61. Process according to Claim 59, in which an  
35 open-pore, adhesive-compatible material (4) is applied over part of the shoe and the side region.

62. Process according to one of Claims 59 to 61, in which the surface of the open-pore, adhesive-compatible

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material (4) is cemented flush in the reactive hot-melt adhesive (3).

63. Process according to one of Claims 59 to 62, in which the underside of the shoe to be further processed  
5 is provided with a flat and uniform surface.

64. Process according to one of Claims 59 to 63, in which the upper is joined to the insole (1) by means of cement-lasting.

65. Process according to Claim 64, in which the  
10 reactive hot-melt adhesive (3) is applied over a width of about 1 cm, overlapping between the insole (1) and the lasted upper.

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